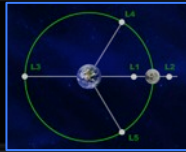




Reaching The Red Planet: NASA's Space Launch System

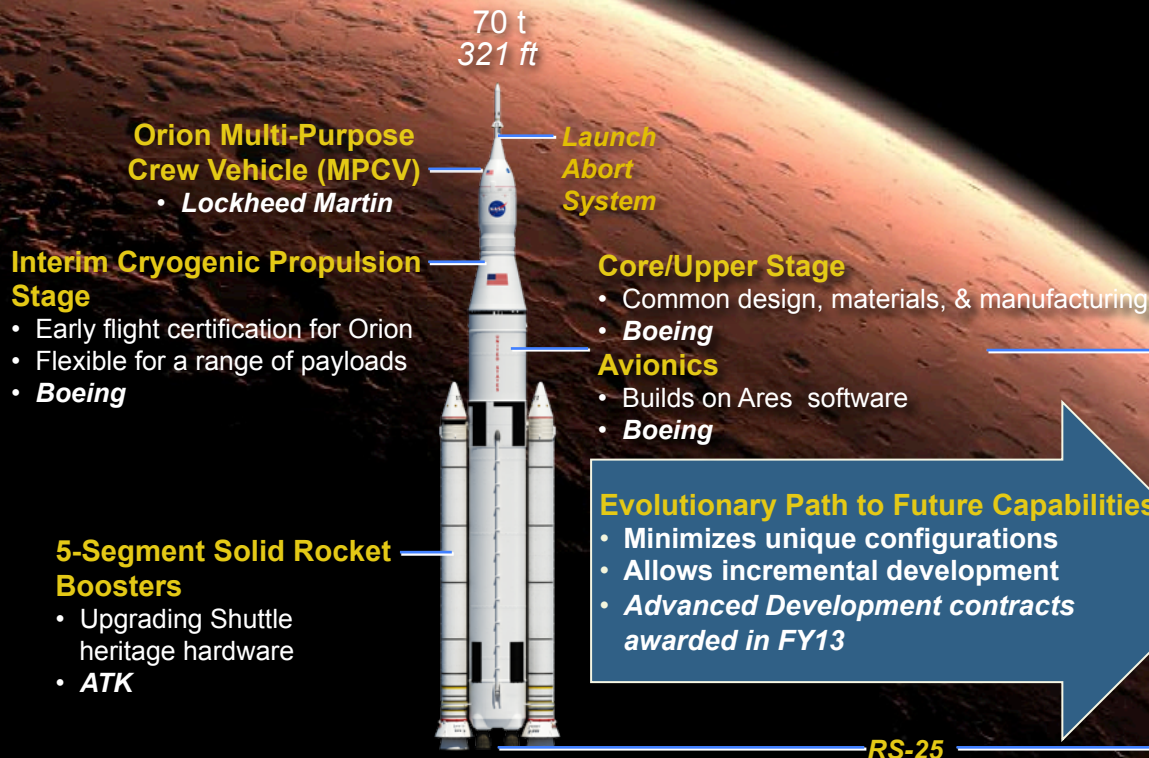
Todd May, Manager
Space Launch System (SLS) Program
May 6, 2013



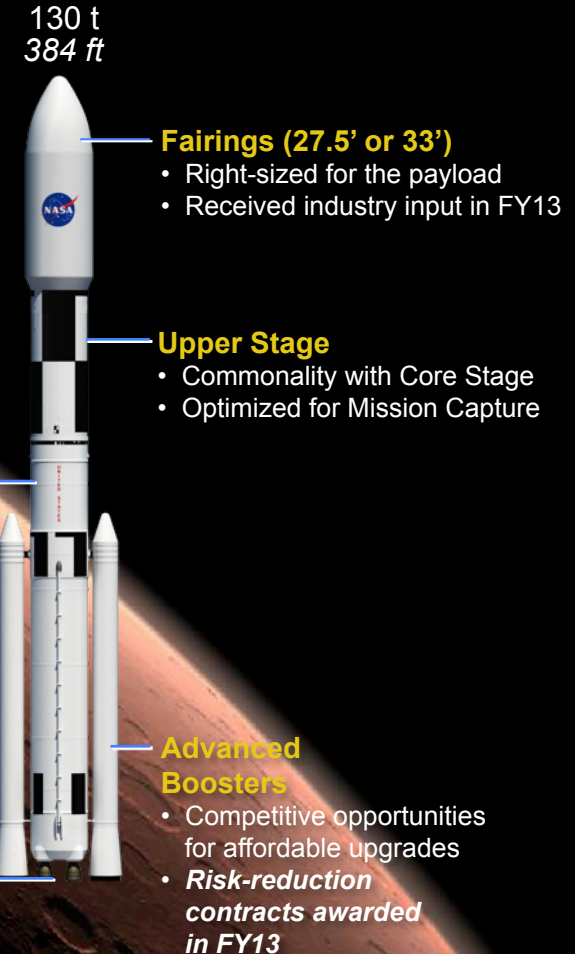
Building on the U.S. Infrastructure



INITIAL CAPABILITY, 2017–21



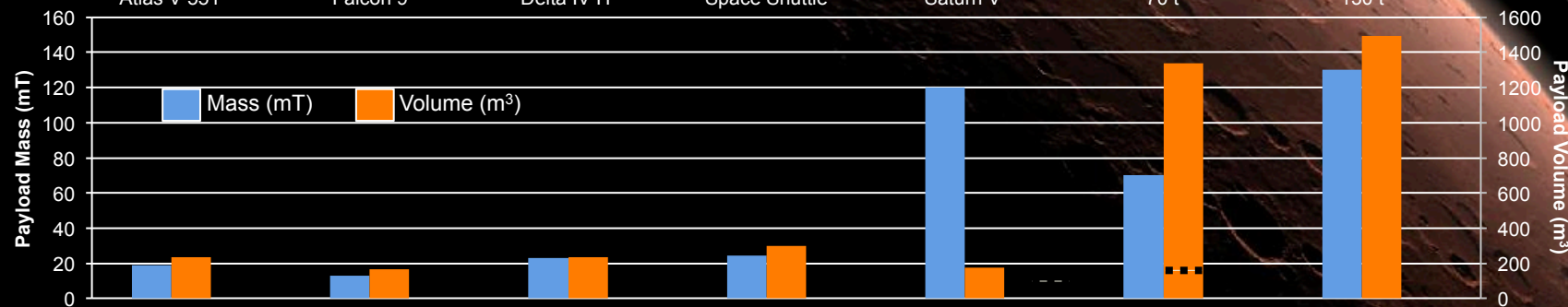
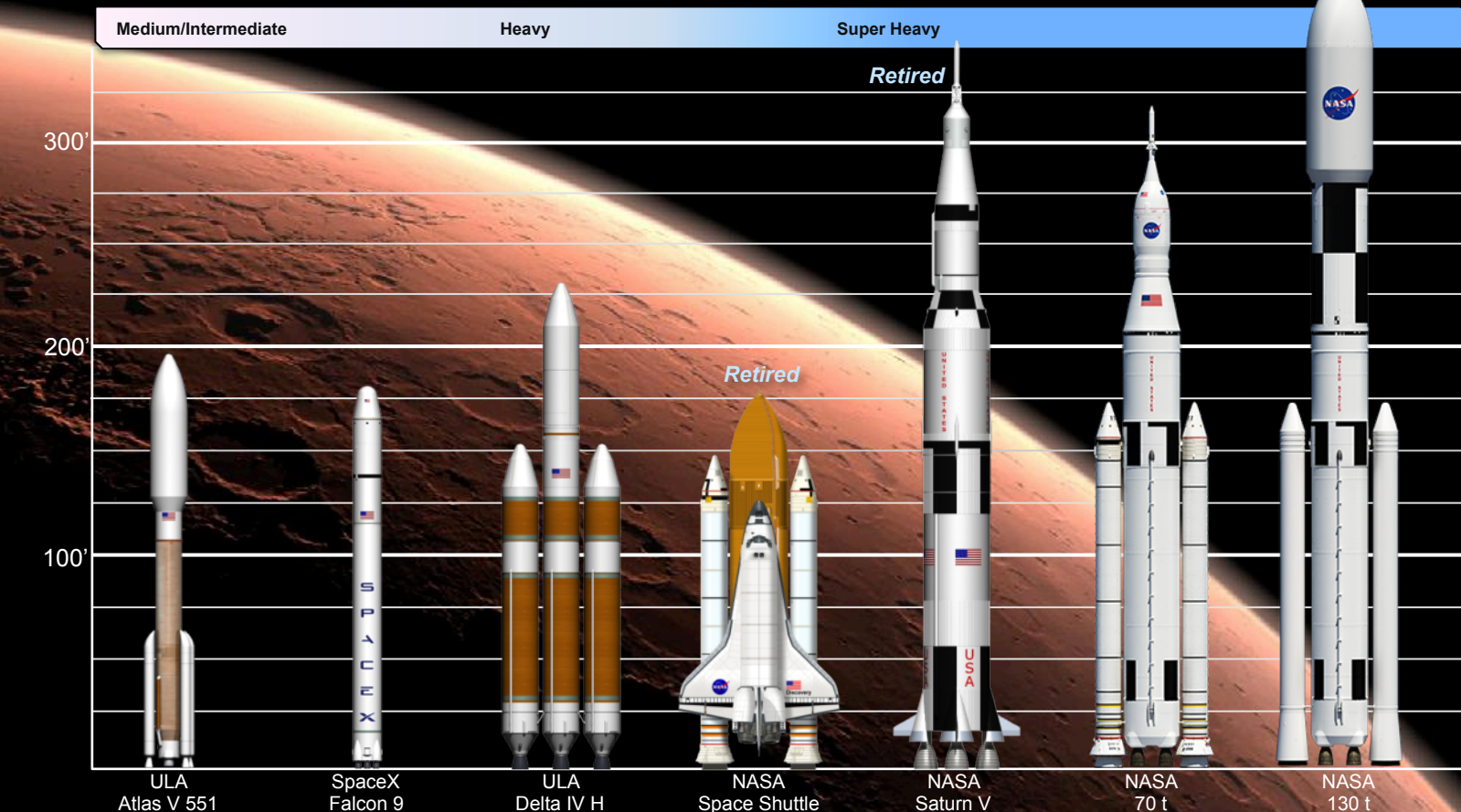
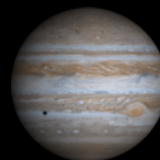
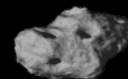
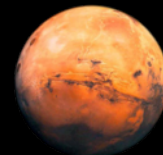
EVOLVED CAPABILITY, Post–2021



- Core Stage Engines**
- Using Space Shuttle Main Engine inventory assets
 - Building on the U.S. state of the art in liquid oxygen/hydrogen
 - Initial missions: Pratt & Whitney Rocketdyne
 - Future missions: Agency is determining acquisition strategy

Working with Industry Partners to Develop America's Heavy-Lift Rocket

Most Capable U.S. Launch Vehicle

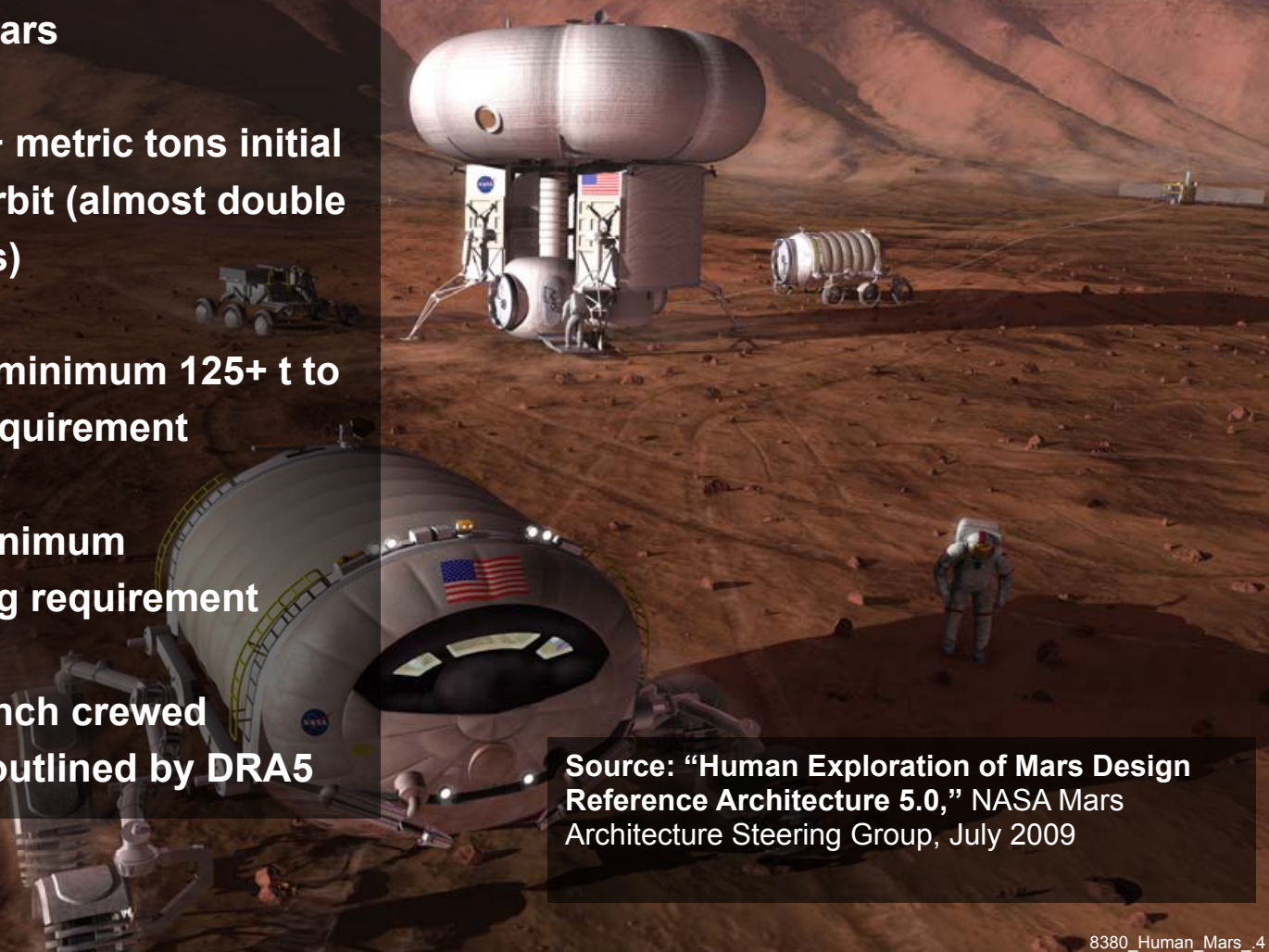


As of May 2, 2013

NASA Humans to Mars Architecture



- ◆ NASA's 2009 Design Reference Architecture 5 outlines plan for 900-day human mission to Mars
- ◆ DRA5 requires 800+ metric tons initial mass to low Earth orbit (almost double ISS assembled mass)
- ◆ SLS exceeds DRA5 minimum 125+ t to LEO mass launch requirement
- ◆ SLS meets DRA5 minimum 10-m-diameter fairing requirement
- ◆ SLS enables 7-9 launch crewed mission to Mars as outlined by DRA5



Source: "Human Exploration of Mars Design Reference Architecture 5.0," NASA Mars Architecture Steering Group, July 2009

SLS: Taking Shape Today



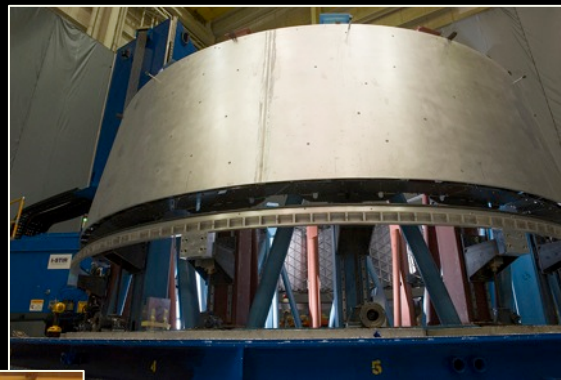
Liquid Engines:

March 2013 – Test of selective laser melting component on J-2X in A-2 test stand at Stennis Space Center



Boosters:

January 2013 – Solid Rocket Booster Flight Control Test-2 at ATK in Promontory, Utah



Spacecraft and Payload Integration:

February 2013 – Production of the first flight version of the MSA at Marshall Space Flight Center

Advanced Development:

January 2013 – F-1 engine gas generator hot fire test at Marshall Space Flight Center



Core Stage:

December 2012 – First test panel for SLS Core Stage liquid hydrogen at AMRO Fabricating Corp. in South El Monte, Calif.

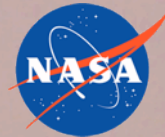


Currently Ongoing – Refurbishment of Michoud Assembly Facility in Louisiana to prepare for SLS Core Stage construction



Systems Engineering and Integration:

November 2012 – SLS buffet model in Langley Research Center's Transonic Dynamics Tunnel



‘Somewhere, something incredible is waiting to be known.’

— Carl Sagan

For More Information

www.nasa.gov/sls

www.twitter.com/nasa_sls

www.facebook.com/nasasls



Mars Landing: Heading for the High Ground
Courtesy of Dan Durda